

degenerated into wings

The common *Ligusticum* have the carpels (without the wings) with a ~~homo~~ semi-circular transverse section a little flatter or a little less so but not far from the semi-circle - they look flat - because the lateral wings or ribs are more prominent than the others - and the ~~rib~~ <sup>vein</sup> ~~veins~~ when <sup>visible</sup> present are indefinite generally about 10 to 14 besides the ~~central~~ <sup>central</sup> one. (*L. acuticum* is in some respects exceptional but not enough I think to make a genus of its kind.)

*Selinum* is like *Ligusticum*, but in most species looks flatter because the lateral ribs or wings are broader and is often shorter - and the ribs always separate the vittae - there are often 2 vittae in the lateral valleculae but almost always only one large one in the dorsal valleculae. *Conioselinum* <sup>pauciflorum</sup> seems to me to have just such a fruit as *Selinum* <sup>pauciflorum</sup> *Canadense* & the *Andes* *Percheri* - but the European and *S. nigricum* etc seem to me to have a longer fruit and indefinite vittae - the vittae are however I admit very ~~useless~~ <sup>useless</sup> but I can find nothing <sup>more positive</sup> ~~to separate~~ *Carum* from *Rupicapilla* *Selinum* (*Sedum* of authors) from *Ligusticum* *Cumidarium* from *Parula* and if you wait for positive characters every genus of this whole set will break down.

When you get quite ripe fruit of all *Umbelliferae* species and work them all up & then you may find better distinctions and ascertain really how far the fruits of a species vary. If you have means it would be very important to grow them in your garden when you could be sure of ripe fruit - It is only from you that we can expect a really good arrangement of American *Umbelliferae* - I have worked hard at them and failed and am not much disposed to begin *de novo* - I am now thoroughly taken up with the 2<sup>nd</sup> vol of *Flora Australasica* & am in the midst of correcting the most inconsiderable *gâchis* De Meis has made in *Goodenacium* - when this vol is done I must take to composition for *Genera*.

Your ever sincerely

If the specimens are so George Bentham  
sincerely I cannot help them out of their difficulties.


25 Wotton Place  
Nov 9 1867



My dear Gray

I ought to have written to you some days since but have had too much at one on my hand - We grieved much for Mrs Gray's loss for which time alone can give consolation and trust that she has not overdone her strength - You ask about old Martin he looks aged - looks older than he is (73) but is very active and busy - he and his were very kind and friendly and we enjoyed ourselves much the week we spent with him. - I am very much pleased at my address having met with your approbation but think you have made too much of it - it was intended more for you than for you for I cannot know enough about you not to fall into some mistake - I find I quite overlooked one of your letters the Essex Institute of Salem which (from what we have since received) appears to be active - My settlement of the country I mean our common acceptance of settling into order after war and tumult.

Now as to *Umbelliferae* I expect to all your criticisms - I admit that among the

compound ones - that is the Haplozygite there  
is not a single good tribe and scarce a good  
genus - all I can say is that after turning and  
twisting them about in every way I could I  
could not find any better ones. Then as to your  
N. American ones I was in peculiar difficulties  
they would not combine with the Mediterranean  
& Levant ones besides that there were so many of  
which I had not the fruit quite ripe, and  
though in many cases you can judge of the  
fruit especially of the vittae before it is ripe  
in many others you cannot tell the shape till the  
last moment. Almost all Umbelliferae have the  
ovary nearly terete at the time of flowering - in  
some it begins to take its shape very soon after  
fecundation in others not till very late. In  
some of the flattest of the eastern *Pseudona* it  
is almost terete or even laterally compressed till  
long after the albumen has begun to consolidate  
(as in Lindsley's *Opidia*). Some *Perelinae* appear to  
be *Amminae* till they are quite ripe, the thickness  
of the pipe next to the commissure seems to be the  
last operation - and if a fruit is dried before it is  
ripe it is apt to shrink more there than in other  
parts. Still in most cases the shape of the trans-  
verse section of the fruit seems to be a more  
constant and more natural character than the  
vittae - a much more certain one than the  
petals which vary in shape according to station  
and region. One of the best genera is *Dupleura*  
but its <sup>fruit</sup> character and indeed the only constant one is  
the foliage - which we can't take for other genera.

But as to particulars you say that a distinction good  
for between *Impatiens* and *Leandriana* with *Muscium*  
in the former and *Conopodium* in the latter - I say very  
little - yet take the typical *Conopodium*  with the fruit  
laxity at the top smooth with a  
pericarp and scarcely prominent ribs, and you have a  
very different fruit from *Muscium* with its promi-  
nent ribs giving an angular shape to the ~~transverse~~  
section of the carpel and rounded at the top - much  
more evidently contracted at the commissure than even  
in *Calyptra*. I think if you put the species of *Conopodium*  
together including *Calyptra* you will say they must be  
congeners and if they are united with any other it must  
be with the *Dunian* set of *Pimpinella* - but to go  
into all the details of comparison would lead me much too  
far. *Conopodium* is <sup>think</sup> *Randiacera*, but runs into *Pimpinella*  
rather than into *Impatiens*.

Next as to *Leptocarpium* Euland are 2 carpels from  
Nuttall's specimen which I think have the trans-  
verse section of  
  Here is I presume  
a slip in the pen in my character  
of *Leptocarpium* in the <sup>word</sup> *near* it ought to  
have been *near* - for though they are *Leptocarpium*  
always more slender than in *Perelinae* they are rarely  
absolutely slender in all species.

The European and Asiatic *Perelinae* are numerous and  
although they have the aspect of *Leptocarpium*, I think they  
are always to be distinguished by the few vittae - vittae at  
least in the 2 dorsal walls only and the more decided wedge  
rib - and all I have seen of *Conocarpium* Fischer belong  
to that category, at the same time here, elsewhere there  
is no absolute line.

I kept up *Leptocarpium* because in Nuttall's specimen  
the fruit has a much more prominent margin than  
in any *Leptocarpium* - almost like that of *Malabarica*  
and the vittae are very obscure. *Perelinae*, *Californica* one  
is evidently a good *Perela* - so are some of your western  
*Pseudona* which Hooker formerly put with *Perela*.

I think *Archangelica* *gustata* must remain in *Archangelica*  
where there is a general tendency towards it in the fruit  
though I thought that even in that genus the latter ones



Nov 10 [1867]

I have received the sheet of *Littina* <sup>spina</sup> ~~spina~~  
with my address

I have examined the seeds you sent of  
*Chocrophyllum californicum* Torr. and I do not  
see why they should not go with *C. villonum*  
Well. and *C. procumbens*, Lam in both of which  
the ribs are slender

*Conocleium* or *Ligusticum scopulorum* is  
nearer *Ligusticum* than anything else but different  
from all I am acquainted with in the much  
greater development of the dorsal rib than the  
lateral or intermediate ones. Whether this is constant or  
not remains to be seen. The fruits I looked had no  
good seed. The vittae were much more external than  
usually in *Ligusticum*

My abstract notion of *Arumineae* is as in the  
first three of the above the section of each carpel  
a circle pentagon or hexagon - of *Reschaiseae* as in the  
last three a semicircle or if a pentagon the lateral  
cavity made up by the immensely thick lateral  
ribs as in most *Penantheae* and I believe these  
distinctions hold good in the majority of species  
though in all large genera there are more or less  
abnormal species which intervene to break down the  
limits

As to campyloperous seeds there are all sorts of  
intermediates between all the above form N<sup>o</sup> 1 passing  
gradually into the flat face - in many species

The transverse section will vary according as the seed has had time fully to ripen on the plant in favorable weather or whether it has been gathered (or suddenly dried by a specially hot sun) before it has quite puffed out but yet ripened enough to have perfected the embryo and germinant. In many cases the transverse section varies according to whether it is taken in the middle of the seed or toward the top or bottom. In others e.g. our *Aleum attamontium* it varies in different specimens (all with perfectly good seed) at least from n. 1 to n. 3 of the above diagrams. *Dupleurum* has some species with very complex perianthium seed in others they are ~~just~~ <sup>just</sup> fully or <sup>the</sup> perianthium in the same genus there are species with numerous vittae solitary vittae and none at all. Their inflorescence and involucre still more various, they are from good sized trees to small annuals - but the drumlike shaped fruit and the foliage and perhaps also the petals and disk (Cytology) appear to be constant.

I have ascertained from typical specimens which I saw at Berlin and have since examined here that *Obtundanthus* Ehrenb. *Ann.* p. 903 = *Quaestio prolifera*, the rays are ~~hard~~ but not <sup>specimens</sup> ~~specimens~~. *Fronepa* C. Koch = *Carum* (*Petroelinum vegetum* Koch). *Eleutheroperum* C. Koch. Fruit unripe seems to be a *Leguminosum*.

*Guernicaria* C. Koch = *Puccinia* Ni. which as observed p. 1000 I should refer to *Pimpinella*.

I have not looked into Mezger's new Japanese genera - some are founded on unripe fruit! which is barbarous.